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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/728,831

12/08/2003

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01/07/2008

EXAMINER

DWIVEDI, VIKANSHA S

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

01/07/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/728,831	Applicant(s) LU ET AL.	
	Examiner Vikansha S. Dwivedi	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-16 and 19-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-15, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 16, 19-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/08/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 11-16 and 19-22 that read on the elected specie shown in Figures 5A-7 in the reply filed on 7/16/2007 is acknowledged.

Claim Objections

Claim 11 is objected to because of the following informalities: "communicates" seems to be in error for - -communicating- -. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant has elected figures 5A-7, the elected figures do not show the magnetic field generating unit as claimed in claim 11. Figure 7 is an elevation view illustrating a magnetic field generating component on the top lid shown in figure 5B. Applicant has clearly mentioned in the specification that a magnetic field generating unit is a electromagnet switch 50 as shown in figure 1. The magnetic field generating unit that

generates magnetic field and drives the ferro-fluid/magneto-rheological fluid 70 based on a predetermined frequency. It is clear that the two movable magnets 56 are disposed on the top lid to correspond to position of the ferro-fluid/magneto-rheological fluid unit 70 in the accommodating space 65, so that the ferro-fluid/magneto-rheological fluid unit 70 is magnetized by the movable magnets 56 to form a magnetic solid. And the magnetic solid is driven to shift position when the movable magnet 56 move. The movable magnets 56 on the top lid 55 serve as a driving source for the micro pump. Applicant has mentioned that as shown in figures 6A and 6B, the two movable magnets 56 move to the center of the top lid 55 to drive two corresponding ferro-fluid/magneto-rheological fluid units 70 to shift until they approach each other. The working fluid in the accommodating space is then squeezed by the ferro-fluid/magneto-rheological fluid units 70, so that the output of the working fluid via the exit 62 is greater than input of the working fluid via the entrance 61, and the micro pump performs a pump mode operation. On the other hand when the movable magnets 56 are driven to repel from each other until they return to two corresponding sides of the top lid 55, the input of the working fluid via the entrance 61 is greater than the output of the working fluid via the exit 62 due to a pressure drop in the accommodating space 65. And the micro pump performs a supply mode operation to complete one pump cycle. It is not clear what is the driving force/source of the magnets is.

Applicant has further suggested that the magnetic field of the electromagnets 57 may be initiated in sequence from two sides of top lid 55 to its center as indicated by arrows in the diagram, so as to achieve the equivalent magnetic field shifting effect

produced by the movable magnets 56 in the figure 5B. As a result the two corresponding fero-fulid/magneto-rheological fluid units 70 shift in the accommodating space 65 until they approach each other, in order to produce a satisfactory fluid driving effect. It is not clear what is the driving force/source of the magnet and how is the sequence initiated as described in the specification and where is this feature shown in figures 5A-7 as claimed in claim 11.

Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant claims that the fero-fulid/magneto-rheological fluid is immiscible to the working fluid. Applicant has not shown any limiting boundries or compartments and has not made clear how the fero-fulid/magneto-rheological fluid is immiscible to the working fluid.

Claims 21 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant claims that the magnetic field generating unit is a movable magnet capable of driving position shifting of the fero-fulid/magneto-rheological fluid also magnetic field generating unit is a sequential actuating electromagnet arranged in a

array, again it is not clear how is the magnet in claim 21 driven and what actuates the magnets in claim 22.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 recites the limitation "the membrane" in line 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the membrane" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the second space" in line 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claims 16, 19-20 are objected to because of the following informalities: claims 16, 19-20 depend from claims rejected under 35 U.S.C. 112, 1st and 2nd paragraph as set forth in this office action. Appropriate correction is required.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vikansha S. Dwivedi whose telephone number is 571-272-7834. The examiner can normally be reached on M-F, 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

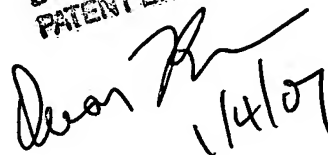
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VSD

DEVON C. HENDERSON
PATENT EXAMINER


1/4/07